

**WHAT IS CLAIMED IS:**

1. A device for displaying a picture in a mobile terminal, which comprises:
  - 5 a direction detecting section comprising at least one magnet fixed within the mobile terminal and a plurality of sensors for detecting the magnet in order to detect the direction in which the mobile terminal is turned and generating a first direction detecting signal, a second direction detecting signal, a third direction detecting signal, and a fourth direction detecting signal;
  - 10 a control section for outputting picture data having an orientation based on the detected direction; and
  - a display section for displaying the picture data.
2. The device according to claim 1, wherein said control section
  - 15 outputs data in an upright direction when the first direction detecting signal is generated, in a direction turned 90° counter-clockwise when the second direction detecting signal is generated, in a direction turned 180° when the third direction detecting signal is generated, or in a direction turned 270° counter-clockwise when the fourth direction detecting signal is generated.
- 20 3. The device according to claim 1, wherein said direction detecting section comprises:
  - first and second magnets fixed within the mobile terminal; and
  - a first sensor, a second sensor, a third sensor, and a fourth sensor for
  - 25 detecting the first and second magnets according to the direction in which the mobile terminal is turned and generating a corresponding direction detecting signal.
4. A device for displaying a picture in a mobile terminal, which
  - 30 comprises:  - a camera module for photographing an image signal;
  - an image processing section for processing the image signal photographed by the camera module in a display picture size;

a direction detecting section comprising at least one magnet fixed within the mobile terminal and a plurality of sensors for detecting the magnet in order to detect the direction in which the mobile terminal is turned and generate a first direction detecting signal, a second direction detecting signal, a third direction  
 5 detecting signal, and a fourth direction detecting signal;

a control section for outputting picture data having an orientation based on the detected direction; and

a display section for displaying the picture data.

10           5.       The device according to claim 4, wherein said control section outputs data in an upright direction when the first direction detecting signal is generated, in a direction turned 90° counter-clockwise when the second direction detecting signal is generated, in a direction turned 180° when the third direction detecting signal is generated, or in a direction turned 270° counter-clockwise  
 15 when the fourth direction detecting signal is generated

6.       A device for displaying a picture in a mobile terminal, which comprises:

a tuner for receiving a composite television video signal broadcast on a  
 20 selected channel;

a decoder for decoding the composite video signal to generate an analog video signal and a synchronizing signal;

a video processing section for converting the analog video signal into a digital video data, processing the digital video data in a frame size and outputting  
 25 a frame video signal and user data in the frame;

a direction detecting section comprising at least one magnet fixed within the mobile terminal and a plurality of sensors for detecting the magnet in order to detect the direction in which the mobile terminal is turned and generate a first direction detecting signal, a second direction detecting signal, a third direction  
 30 detecting signal, and a fourth direction detecting signal;

a control section for outputting picture data having an orientation based on the detected direction; and

a display section for displaying the picture data.

7. The device according to claim 6, wherein said control section outputs data in an upright direction when the first direction detecting signal is generated, in a direction turned 90° counter-clockwise when the second direction  
5 detecting signal is generated, in a direction turned 180° when the third direction detecting signal is generated, or in a direction turned 270° counter-clockwise when the fourth direction detecting signal is generated

8. A device for displaying a picture in a mobile terminal, which  
10 comprises:

a direction detecting section comprising at least one projection fixed on the mobile terminal and a plurality of sensors for detecting the projection in order to detect the direction in which the mobile terminal is turned and generate a first direction detecting signal, a second direction detecting signal, a third direction  
15 detecting signal, and a fourth direction detecting signal;

a control section for outputting picture data having an orientation based on the detected direction; and

a display section for displaying the picture data.

20 9. The device according to claim 8, wherein said control section outputs data in an upright direction when the first direction detecting signal is generated, in a direction turned 90° counter-clockwise when the second direction detecting signal is generated, in a direction turned 180° when the third direction detecting signal is generated, or in a direction turned 270° counter-clockwise  
25 when the fourth direction detecting signal is generated.

10. The device according to claim 8, wherein said direction detecting section comprises:

a first projection, a second projection, a third projection, and a fourth  
30 projection fixed on the mobile terminal; and

a first sensor, a second sensor, and a third sensor for detecting the first projection, the second projection, the third projection and the fourth projection according to the direction in which the mobile terminal is turned and generating a

corresponding direction detecting signal.

11. A device for displaying a picture in a mobile terminal, which comprises:

- 5 a camera module for photographing an image signal;
- an image processing section for processing the image signal photographed by the camera module in a display picture size;
- a direction detecting section comprising at least one projection fixed on the mobile terminal and a plurality of sensors for detecting the projection in order
- 10 to detect the direction in which the mobile terminal is turned and generate a first direction detecting signal, a second direction detecting signal, a third direction detecting signal, and a fourth direction detecting signal;
- a control section for outputting picture data having an orientation based on the detected direction; and
- 15 a display section for displaying the picture data.

12. The device according to claim 11, wherein said control section outputs data in an upright direction when the first direction detecting signal is generated, in a direction turned 90° counter-clockwise when the second direction

20 detecting signal is generated, in a direction turned 180° when the third direction detecting signal is generated, or in a direction turned 270° counter-clockwise when the fourth direction detecting signal is generated.

13. A device for displaying a picture in a mobile terminal, which

25 comprises:

- a tuner for receiving a composite television video signal broadcast on a selected channel;
- a decoder for decoding the composite video signal to generate an analog video signal and a synchronizing signal;
- 30 a video processing section for converting the analog video signal into a digital video data, processing the digital video data into a frame size and outputting a frame video signal and user data in the frame;
- a direction detecting section comprising at least one projection fixed on

the mobile terminal and a plurality of sensors for detecting the projection in order to detect the direction in which the mobile terminal is turned and generate a first direction detecting signal, a second direction detecting signal, a third direction detecting signal, and a fourth direction detecting signals;

- 5           a control section for outputting picture data having an orientation based on the detected direction; and  
          a display section for displaying the picture data.

14.       The device according to claim 13, wherein said control section  
10       outputs data in an upright direction when the first direction detecting signal is generated, in a direction turned 90° counter-clockwise when the second direction detecting signal is generated, in a direction turned 180° when the third direction detecting signal is generated, or in a direction turned 270° counter-clockwise when the fourth direction detecting signal is generated.

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15.       A device for displaying a picture in a mobile terminal, which comprises:

          a direction detecting section comprising at least one projection and at least one magnet fixed on or in the mobile terminal and a plurality of sensors for  
20       detecting the projection or the magnet in order to detect the direction in which the mobile terminal is turned and generate a first direction detecting signal, a second direction detecting signal, a third direction detecting signal, and a fourth direction detecting signals;

          a control section for outputting picture data having an orientation based  
25       on the detected direction; and  
          a display section for displaying the picture data.

16.       The device according to claim 15, wherein said control section  
          outputs data in an upright direction when the first direction detecting signal is  
30       generated, in a direction turned 90° counter-clockwise when the second direction detecting signal is generated, in a direction turned 180° when the third direction detecting signal is generated, or in a direction turned 270° counter-clockwise when the fourth direction detecting signal is generated.

17. The device according to claim 15, wherein said direction detecting section comprises:

one projection and first and second magnets fixed on or in the mobile  
5 terminal; and

a first sensor, a second sensor, and a third sensor for detecting the projection and the magnets according to the direction in which the mobile terminal is turned and generating a corresponding direction detecting signal.

10 18. A device for displaying a picture in a mobile terminal, which comprises:

a camera module for photographing an image signal;

an image processing section for processing the image signal photographed by the camera module in a display picture size;

15 a direction detecting section comprising at least one projection and at least one magnet fixed on or in the mobile terminal and a plurality of sensors for detecting the projection or the magnet in order to detect the direction in which the mobile terminal is turned and generate a first direction detecting signal, a second direction detecting signal, a third direction detecting signal, and a fourth direction  
20 detecting signal;

a control section for outputting picture data having an orientation based on the detected direction; and

a display section for displaying the picture data.

25 19. The device according to claim 18, wherein said control section outputs data in an upright direction when the first direction detecting signal is generated, in a direction turned 90° counter-clockwise when the second direction detecting signal is generated, in a direction turned 180° when the third direction detecting signal is generated, or in a direction turned 270° counter-clockwise  
30 when the fourth direction detecting signal is generated.

20. A device for displaying a picture in a mobile terminal, which comprises:

a tuner for receiving a composite television video signal broadcast on a selected channel;

a decoder for decoding the composite video signal to generate an analog video signal and a synchronizing signal;

5 a video processing section for converting the analog video signal into a digital video data, processing the digital video data in a frame size and outputting a frame video signal and user data in the frame;

a direction detecting section comprising at least one projection or at least one magnet fixed on or in the mobile terminal and a plurality of sensors for  
10 detecting at least one of the projection and the magnet in order to detect the direction in which the mobile terminal is turned and generate a first direction detecting signal, a second direction detecting signal, a third direction detecting signal, and a fourth direction detecting signal;

a control section for outputting picture data having an orientation based  
15 on the detected direction; and

a display section for displaying the picture data.

21. The device according to claim 20, wherein said control section outputs data in an upright direction when the first direction detecting signal is  
20 generated, in a direction turned 90° counter-clockwise when the second direction detecting signal is generated, in a direction turned 180° when the third direction detecting signal is generated, or in a direction turned 270° counter-clockwise when the fourth direction detecting signal is generated.

25 22. A device for displaying a picture in a mobile terminal, which comprises:

a direction detecting section comprising a magnet fixed within the mobile terminal and a plurality of sensors for detecting the polarity of the magnet in order to detect the direction in which the mobile terminal is turned and  
30 generate a first direction detecting signal, a second direction detecting signal, a third direction detecting signal, and a fourth direction detecting signals;

a control section for outputting picture data having an orientation based on the detected direction; and

a display section for displaying the picture data.

23. The device according to claim 22, wherein said control section outputs data in an upright direction when the first direction detecting signal is generated, in a direction turned 90° counter-clockwise when the second direction  
5 detecting signal is generated, in a direction turned 180° when the third direction detecting signal is generated, or in a direction turned 270° counter-clockwise when the fourth direction detecting signal is generated.

10 24. The device according to claim 22, wherein said direction detecting section includes:

a magnet fixed within the mobile terminal;  
first and second sensors for detecting the N pole of the magnet; and  
third and fourth sensors for detecting the S pole of the magnet.

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25. The device according to claim 22, wherein said direction detecting section includes:

a magnet fixed within the mobile terminal; and  
first and second sensors for detecting the N pole and S pole of the  
20 magnet.

26. A device for displaying a picture in a mobile terminal, which comprises:

a direction detecting section comprising a magnet fixed within the  
25 mobile terminal, first and second sensors for detecting the N pole of the magnet and third and fourth sensors for detecting the S pole of the magnet in order to detect the direction in which the mobile terminal is turned according to the pole detected by one of the four sensors and generate a first direction detecting signal, a second direction detecting signal, a third direction detecting signal, and a fourth  
30 direction detecting signal;

a control section for outputting picture data having an orientation based on the detected direction; and

a display section for displaying the picture data.

27. The device according to claim 26, wherein said control section outputs data in an upright direction when the first direction detecting signal is generated, in a direction turned 90° counter-clockwise when the second direction  
5 detecting signal is generated, in a direction turned 180° when the third direction detecting signal is generated, or in a direction turned 270° counter-clockwise when the fourth direction detecting signal is generated.

28. A device for displaying a picture in a mobile terminal, which  
10 comprises:

a direction detecting section comprising a magnet fixed within the mobile terminal and first and second sensors for detecting the N and S poles of the magnet in order to detect the direction in which the mobile terminal is turned according to the pole detected by one of the two sensors and generate a first  
15 direction detecting signal, a second direction detecting signal, a third direction detecting signal, and a fourth direction detecting signal;

a control section for outputting picture data in an upright direction having an orientation based on the detected direction; and

a display section for displaying the picture data.  
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29. The device according to claim 28, wherein said control section outputs data in an upright direction when the first direction detecting signal is generated, in a direction turned 90° counter-clockwise when the second direction detecting signal is generated, in a direction turned 180° when the third direction  
25 detecting signal is generated, or in a direction turned 270° counter-clockwise when the fourth direction detecting signal is generated.

30. A method for displaying a picture on a mobile terminal which includes a direction detecting section comprising at least one fixed magnet and a  
30 plurality of sensors for detecting the magnet, said method comprising the steps of:

detecting a direction signal indicating the direction in which the mobile terminal is turned, using the sensors for detecting the magnet; and

outputting and displaying picture data in an orientation based on the detected signal.

5           31.       The method according to claim 30, wherein when no direction signal is received from the sensors, making a determination as to when a first direction signal is detected and outputting and displaying picture data in an upright direction;

              when a second direction signal is detected, outputting and displaying the  
10 picture data in a direction turned 90° counter-clockwise;

              when a third direction signal is detected, displaying the picture data in a direction turned 180°; and

              when a fourth direction signal is detected, outputting and displaying the picture data in a direction turned 270° counter-clockwise.

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              32.       The method according to claim 30, wherein said direction detecting section, if composed of first and second magnets and the first sensor, the second sensor, the third sensor and the fourth sensor for detecting the first and second magnets, generates:

20           the first direction signal when no direction detecting signal is output from the sensors, thereby displaying the picture data in the upright direction;

              the second direction signal when the second sensor detects the first magnet, thereby displaying the picture data in a direction turned 90° counter-clockwise;

25           the third direction signal when the second sensor detects the first magnet and simultaneously the third sensor detects the second magnet, thereby displaying the picture data in a direction turned 180°; and

              the fourth direction signal when the first sensor detects the first magnet, thereby displaying the picture data in a direction turned 270° counter-clockwise.

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              33.       A method for displaying a picture on a mobile terminal which includes a direction detecting section comprising at least one fixed magnet and a

plurality of sensors for detecting the magnet, said method comprising the steps of:

detecting a direction signal indicating the direction in which the mobile terminal is turned, using a sensor contacting the magnet; and

5        outputting and displaying picture data in an orientation based on the detected signal.

34.        The method according to claim 33, wherein when no direction  
10        signal is received from the sensors, making a determination as to when a first direction signal is detected and outputting and displaying picture data in an upright direction;

when a second direction signal is detected, outputting and displaying the picture data in a direction turned 90° counter-clockwise;

15        when a third direction signal is detected, displaying the picture data in a direction turned 180°; and

when a fourth direction signal is detected, outputting and displaying the picture data in a direction turned 270° counter-clockwise.

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35.        The method according to claim 33, wherein said direction detecting section, if composed of first and second magnets and the first sensor, the second sensor, the third sensor and the fourth sensor for detecting the first and second magnets, generates:

25        the first direction signal when no direction detecting signal is output from the sensors, thereby displaying the picture data in the upright direction;

the second direction signal when the second sensor detects the first magnet, thereby displaying the picture data in a direction turned 90° counter-clockwise;

30        the third direction signal when the second sensor detects the first magnet and simultaneously the third sensor detects the second magnet, thereby displaying the picture data in a direction turned 180°; and

the fourth direction signal when the first sensor detects the first magnet,

thereby displaying the picture data in a direction turned 270° counter-clockwise.

36. A method for displaying a picture on a mobile terminal which includes a direction detecting section comprising at least one projection and a plurality of sensors for detecting the projection, said method comprising the steps of:

detecting a direction signal indicating the direction in which the mobile terminal is turned, using a sensor contacting the projection; and

outputting and displaying picture data in an orientation based on the detected signal.

37. The method according to claim 36, wherein when no direction signal is received from the sensors, making a determination as to when a first direction signal is detected and outputting and displaying picture data in an upright direction;

when a second direction signal is detected, outputting and displaying the picture data in a direction turned 90° counter-clockwise;

when a third direction signal is detected, displaying the picture data in a direction turned 180°; and

when a fourth direction signal is detected, outputting and displaying the picture data in a direction turned 270° counter-clockwise.

38. The method according to claim 36, wherein said direction detecting section, if composed of first and second projections fixed on the outer side of a folder of the mobile terminal, second and fourth projections fixed on the inner side of the folder, and first, second and third sensors for detecting the first, second, third and fourth projections, generates:

the first direction signal when no direction detecting signal is output from the sensors, thereby displaying the picture data in the upright direction;

the second direction signal when the second sensor detects the third projection, thereby displaying the picture data in a direction turned 90°

counter-clockwise;

the third direction signal when the second sensor detects the first projection and simultaneously the third sensor detects the second projection, thereby displaying the picture data in a direction turned 180°; and

5 the fourth direction signal when the first sensor detects the first projection, thereby displaying the picture data in a direction turned 270° counter-clockwise.

10 39. A method for displaying a picture on a mobile terminal which includes a direction detecting section comprising at least one projection and a plurality of sensors for detecting the projection, said method comprising the steps of:

detecting a direction signal indicating the direction in which the mobile  
15 terminal is turned, using a sensor contacting the projection;

when no direction signal is received from the sensors, making a determination as to when a first direction signal is detected and outputting and displaying picture data in an upright direction;

when a second direction signal is detected, generating full size picture  
20 data and displaying the picture data in a direction turned 90° counter-clockwise;

when a third direction signal is detected, displaying the picture data in a direction turned 180°; and

when a fourth direction signal is detected, generating full size picture data and displaying the picture data in a direction turned 270° counter-clockwise.

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40. The method according to claim 39, wherein when no direction signal is received from the sensors, making a determination as to when a first direction signal is detected and outputting and displaying picture data in an upright direction;

30 when a second direction signal is detected, outputting and displaying the picture data in a direction turned 90° counter-clockwise;

when a third direction signal is detected, displaying the picture data in a direction turned 180°; and

when a fourth direction signal is detected, outputting and displaying the picture data in a direction turned 270° counter-clockwise.

- 5           41.     The method according to claim 39, wherein said direction detecting section, if composed of first and second projections fixed on the outer side of a folder of the mobile terminal, second and fourth projections fixed on the inner side of the folder, and first, second and third sensors for detecting the first, second, third and fourth projections, generates:
- 10           the first direction signal when no direction detecting signal is output from the sensors, thereby displaying the picture data in the upright direction;
- the second direction signal when the second sensor detects the third projection, thereby displaying the picture data in a direction turned 90° counter-clockwise;
- 15           the third direction signal when the second sensor detects the first projection and simultaneously the third sensor detects the second projection, thereby displaying the picture data in a direction turned 180°; and
- the fourth direction signal when the first sensor detects the first projection, thereby displaying the picture data in a direction turned 270° counter-
- 20 clockwise.

42.     A method for displaying a picture on a mobile terminal which includes a direction detecting section comprising at least one projection, at least one magnet and a plurality of sensors for detecting the projection or the magnet,
- 25 said method comprising the steps of:
- detecting a direction signal indicating the direction in which the mobile terminal is turned, using a sensor contacting the projection or the magnet; and
- outputting and displaying picture data in an orientation based on the detected signal.

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43.     The method according to claim 42, wherein when no direction signal is received from the sensors, making a determination as to when a first

direction signal is detected and outputting and displaying picture data in an upright direction;

when a second direction signal is detected, outputting and displaying the picture data in a direction turned 90° counter-clockwise;

5 when a third direction signal is detected, displaying the picture data in a direction turned 180°; and

when a fourth direction signal is detected, outputting and displaying the picture data in a direction turned 270° counter-clockwise.

10

44. The method according to claim 42, wherein said direction detecting section, if composed of a projection, first and second magnets and first, second and third sensors for detecting the projection and the first and second magnets, generates:

15 the first direction signal when no direction detecting signal is output from the sensors, thereby displaying the picture data in the upright direction;

the second direction signal when the second sensor detects the second magnet, thereby displaying the picture data in a direction turned 90° counter-  
20 clockwise;

the third direction signal when the first sensor detects the second magnet and simultaneously the second sensor detects the first magnet, thereby displaying the picture data in a direction turned 180°; and

the fourth direction signal when the first sensor detects the first magnet,  
25 thereby displaying the picture data in a direction turned 270° counter-clockwise.

45. A method for displaying a picture on a mobile terminal which includes a direction detecting section comprising at least one projection, at least  
30 one magnet and a plurality of sensors for detecting the projection or the magnet, said method comprising the steps of:

detecting a direction signal indicating the direction in which the mobile terminal is turned, using a sensor contacting the projection or the magnet;

when no direction signal is received from the sensors, making a determination as to when a first direction signal is detected and outputting and displaying picture data in an upright direction; and

outputting and displaying picture data in an orientation based on the  
5 detected signal.

46. The method according to claim 45, wherein when no direction signal is received from the sensors, making a determination as to when a first  
10 direction signal is detected and outputting and displaying picture data in an upright direction;

when a second direction signal is detected, outputting and displaying the picture data in a direction turned 90° counter-clockwise;

when a third direction signal is detected, displaying the picture data in a  
15 direction turned 180°; and

when a fourth direction signal is detected, outputting and displaying the picture data in a direction turned 270° counter-clockwise.

20 47. The method according to claim 45, wherein said direction detecting section, if composed of a projection, first and second magnets and first, second and third sensors for detecting the projection and the first and second magnets, generates:

the first direction signal when no direction detecting signal is output  
25 from the sensors, thereby displaying the picture data in the upright direction;

the second direction signal when the second sensor detects the second magnet, thereby displaying the picture data in a direction turned 90° counter-clockwise;

the third direction signal when the first sensor detects the second magnet  
30 and simultaneously the second sensor detects the first magnet, thereby displaying the picture data in a direction turned 180°; and

the fourth direction signal when the first sensor detects the first magnet, thereby displaying the picture data in a direction turned 270° counter-clockwise.

48. A method for displaying a picture on a mobile terminal which includes a direction detecting section comprising a fixed magnet and a plurality of sensors for detecting the polarity of the magnet, said method comprising the  
5 steps of:

detecting the polarity of the magnet by one of the sensors; detecting a direction signal indicating the direction in which the mobile terminal is turned according to the detected polarity; and

outputting and displaying picture data in an orientation based on the  
10 detected signal.

49. The method according to claim 48, wherein when no direction signal is received from the sensors, making a determination as to when a first  
15 direction signal is detected and outputting and displaying picture data in an upright direction;

when a second direction signal is detected, outputting and displaying the picture data in a direction turned 90° counter-clockwise;

when a third direction signal is detected, displaying the picture data in a  
20 direction turned 180°; and

when a fourth direction signal is detected, outputting and displaying the picture data in a direction turned 270° counter-clockwise.

25 50. The method according to claim 48, wherein said direction detecting section, if composed of a magnet fixed within the mobile terminal, first and second sensors for detecting the N pole of the magnet and third and fourth sensors for detecting the S pole of the magnet, generates:

the first direction signal when no direction detecting signal is output  
30 from the sensors, thereby displaying the picture data in the upright direction;

the second direction signal when the second sensor detects the N pole of the magnet, thereby displaying the picture data in a direction turned 90° counter-clockwise;

the third direction signal when the fourth sensor detects the S pole of the magnet, thereby displaying the picture data in a direction turned 180°; and

the fourth direction signal when the third sensor detects the S pole of the magnet, thereby displaying the picture data in a direction turned 270° counter-  
5 clockwise.

51. The method according to claim 48, wherein said direction detecting section, if composed of a magnet fixed within the mobile terminal, first and second sensors for detecting the S pole of the magnet and third and fourth  
10 sensors for detecting the N pole of the magnet, generates:

the first direction signal when no direction detecting signal is output from the sensors, thereby displaying the picture data in the upright direction;

the second direction signal when the second sensor detects the S pole of the magnet, thereby displaying the picture data in a direction turned 90° counter-  
15 clockwise;

the third direction signal when the fourth sensor detects the N pole of the magnet, thereby displaying the picture data in a direction turned 180°; and

the fourth direction signal when the third sensor detects the N pole of the magnet, thereby displaying the picture data in a direction turned 270° counter-  
20 clockwise.

52. The method according to claim 48, wherein said direction detecting section, if composed of a magnet fixed within the mobile terminal and first and second sensors for detecting the N and S poles of the magnet, generates:  
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the first direction signal when no direction detecting signal is output from the sensors, thereby displaying the picture data in the upright direction;

the second direction signal when the second sensor detects the N pole of the magnet, thereby displaying the picture data in a direction turned 90° counter-  
clockwise;

30 the third direction signal when the second sensor detects the S pole of the magnet, thereby displaying the picture data in a direction turned 180°; and

the fourth direction signal when the first sensor detects the S pole of the magnet, thereby displaying the picture data in a direction turned 270° counter-

clockwise.

53. The method according to claim 48, wherein said direction detecting section, if composed of a magnet fixed within the mobile terminal and  
5 first and second sensors for detecting the N and S poles of the magnet, generates:

the first direction signal when no direction detecting signal is output from the sensors, thereby displaying the picture data in the upright direction;

the second direction signal when the second sensor detects the S pole of the magnet, thereby displaying the picture data in a direction turned 90° counter-  
10 clockwise;

the third direction signal when the second sensor detects the N pole of the magnet, thereby displaying the picture data in a direction turned 180°; and

the fourth direction signal when the first sensor detects the N pole of the magnet, thereby displaying the picture data in a direction turned 270° counter-  
15 clockwise.